BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Application of:	:	Before the Examiner:
Arning et al.	:	Al Hashemi, Sana A.
	:	
Serial No.: 10/044,782	:	Group Art Unit: 2164
	:	
Filing Date: January 11, 2002	:	
	:	IBM Corporation
Title: METHOD, COMPUTER	:	Dept. T81/Bldg. 503
PROGRAM AND DATA	:	P.O. Box 12195
PROCESSING SYSTEM FOR	:	3039 Cornwallis Road
DATA CLUSTERING	:	Research Triangle Park, NC 27709

APPEAL BRIEF

Mail Stop Appeal Brief-Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

I. REAL PARTY IN INTEREST

The real party in interest is International Business Machines, Inc., which is the assignee of the entire right, title and interest in the above-identified patent application.

II. RELATED APPEALS AND INTERFERENCES

There are no other appeals or interferences known to Appellants, Appellants' legal representative or assignee which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

III. STATUS OF CLAIMS

Claims 1-13 are pending in the Application. Claims 1-13 stand rejected. Claims 1-13 are appealed.

IV. STATUS OF AMENDMENTS

Appellants have not submitted any amendments following receipt of the final rejection with a mailing date of September 22, 2006.

V.   SUMMARY OF CLAIMED SUBJECT MATTER

Independent Claim 1:

In one embodiment of the present invention, a method for determining the quality of a result of a clustering data processing operation, the result comprising a set of clusters, a cluster having a set of buckets for each variable, the method comprising the step of determining a foreground frequency of a bucket within a first cluster. Specification, page 7, lines 14-22; Figure 2, step 20. The method further comprises determining a background frequency of the bucket with respect to all of the clusters. Specification, page 7, lines 24-30; Figure 2, step 21. The method further comprises comparing the foreground and background frequencies. Specification, page 8, lines 1-26; Figure 2, step 22. The method further comprises determining a quality index based on the comparison. Specification, page 9, line 1 – page 10, line 9; Figure 2, step 27.

Independent Claim 10:

In one embodiment of the present invention, a method for data clustering, the method comprising the step of performing a number of data clustering operations. Specification, page 11, lines 9-17. The method further comprises determining a quality index for each result of the data clustering operations. Specification, page 11, lines 9-17; Figure 3, steps 31, 32, 33. The method further comprises selecting the result with the highest quality index as an end result of the data clustering. Specification, page 11, lines 19-27; Figure 3, step 34.

Independent Claim 11:

In one embodiment of the present invention, a method for data clustering, the method comprising the step of selecting an initial set of clusters. Specification, page 12, lines 5-14; Figure 4, step 41. The method further comprises determining a quality index for the clusters. Specification, page 12, lines 5-14; Figure 4, step 402. The method further comprises performing a number of iterations to improve the quality index. Specification, page 12, line 28 – page 13, line 9; Figure 4, step 49.

Independent Claim 13:

In one embodiment of the present invention, a computer program product stored on a computer usable medium for determining the quality of a result of a clustering data processing operation, the result comprising a set of clusters, a cluster having a set of buckets for each variable, the method comprising the program product comprising determining first subprocesses for a foreground frequency of a bucket within a first cluster. Specification, page 13, lines 10-23; Figure 5, element P1. The method further comprises determining second subprocesses for a background frequency of the bucket with respect to all of the clusters. Specification, page 13, lines 10-23; Figure 5, element P2. The method further comprises comparing third subprocesses the foreground and background frequencies. Specification, page 13, lines 10-23; Figure 5, element P3. The method further comprises determining fourth subprocesses a quality index based on the comparison. Specification, page 13, lines 10-23; Figure 5, element P4.

VI.   GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

A.   Claims 1-13 stand rejected under 35 U.S.C. §101.

B.   Claims 1-13 stand rejected under 35 U.S.C. §112, second paragraph.

VII.   ARGUMENT

A.   Claims 1-13 are improperly rejected under 35 U.S.C. §101.

The Examiner rejects claims 1-13 under 35 U.S.C. §101 because independent claims 1, 10, 11 and 13 are allegedly merely claiming nonfunctional descriptive material and hence do not produce a useful, tangible result. Office Action (9/22/2006), pages 2-4. Appellants respectfully traverse.

The Congressional intent, is that any new and useful process, machine, manufacture or composition of matter under the sun that is made by man is the proper subject matter of a patent. M.P.E.P. §2106. The subject matter courts have found to be outside the four statutory categories is limited to subject matter that is not a

practical application or use of an idea, a law of nature or a natural phenomenon. *See, e.g., Rubber-Tip Pencil Co. v. Howard*, 87 U.S. (20 Wall.) 498, 507 (1874); M.P.E.P. §2106. Claims 1-9 are directed to a method, which is not outside the four statutory categories, for <u>determining the quality of a result of a clustering data processing operation,</u> the result comprising a set of clusters, a cluster having a set of buckets for each variable. Claims 10-12 are directed to a method, which is not outside the four statutory categories, for <u>data clustering and quality determination</u>. Claim 13 is directed to a computer program product stored on a computer usable medium, which is not outside the four statutory categories, for <u>determining the quality of a result of a clustering data processing operation,</u> the result comprising a set of clusters, a cluster having a set of buckets for each variable.

Appellants respectfully contend that the claimed inventions in claims 1-13 satisfy the test for statutory subject matter recited in *In re Alappat*, and repeated in *State Street Bank & Trust Co. v. Signature Financial Group*, and *AT&T Corp. v. Excel Communications, Inc. In re Alappat*, 33 F.3d 1526, 31 U.S.P.Q.2d 1545 (Fed. Cir. 1994); *State Street Bank & Trust Co. v. Signature Financial Group, Inc.*, 149 F.3d 1368, 47 U.S.P.Q.2d 1596 (Fed. Cir. 1998); *AT&T Corp. v. Excel Communications, Inc.*, 172 F.3d 1526, 50 U.S.P.Q.2d 1547 (Fed. Cir. 1999). The claimed inventions produce a <u>useful, concrete and tangible</u> result in, *inter alia*, data clustering and quality determination and in determining the quality of a result of a clustering data processing operation.

The essential inquiry under *In re Alappat* is to determine whether the claimed subject matter as a whole is directed to a disembodied mathematical concept representing nothing more than a "law of nature" or an "abstract idea" or if, in contrast, the mathematical concept has been reduced to some practical application rendering it useful. *AT&T Corp.*, 172 F.2d at 1357, 50 U.S.P.Q.2d at 1451 (citing *In re Alappat*, 33 F.3d at 1543, 31 U.S.P.Q.2d at 1556-57). Moreover, in making the determination whether the claimed subject matter as a whole is a disembodied mathematical concept or if the concept has been reduced to some practical application rendering it useful, the claims must be construed in the light of the Specification. *See,*

AT&T Corp., 172 F.3d at 1357, 50 U.S.P.Q.2d at 1451 (stating that more than an abstract idea was claimed in *In re Alappat* because the "claimed invention as whole was directed toward forming a specific machine that produced the useful, concrete and tangible result of a *smooth wave form display*") (emphasis supplied). The single claim at issue in *In re Alappat* was directed to a rasterizer and recited elements in means plus function form. *In re Alappat*, 33 F.3d at 1540, 31 U.S.P.Q.2d at 1555. Additionally, none of the limitations recited in the claim at issue expressly claimed a "smooth wave form display". Indeed, the concrete, useful and tangible result relied upon in *In re Alappat*, namely, a smooth uniform display, appears in the background of the invention. *Kuriappan P. Alappat, et al.,* U.S. Patent No. 5,440,676 (col. 1, lines 9-10).

Likewise, in *AT&T Corp.*, the useful, nonabstract result relied upon in holding that the claimed invention was directed to statutory subject matter was that the PIC indicator therein held information about the call recipients PIC, which facilitated differential billing of long-distance calls made by a subscriber. *AT&T Corp*, 172 F.3d 1358, 50 U.S.P.Q.2d at 1452. However, the claim at issue in *AT&T Corp.* was directed to a method including the steps of generating a message record for an interexchange call, and including in the message record a PIC indicator having a value which is a function of whether or not the interexchange carrier associated with the terminating subscriber is a predetermined one of the interexchange carriers. *AT&T Corp.*, 172 F.3d at 1354, 50 U.S.P.Q.2d at 1449. Again, there was no express or explicit claim limitation directed to the useful, concrete, and tangible result relied upon in determining that the aforesaid claim was directed to statutory subject matter. *See, Id.* The relied upon PIC indicator that facilitates differential billing of long-distance calls appears, *inter alia*, in the summary of the invention. *Gerard P. Doherty, et al.,* U.S. Patent No. 5,333,184, col. 1, line 66 through col. 2, line 3.

Likewise, in *State Street Bank & Trust v. Signature Financial Group*, a useful and concrete and tangible result not expressed in an explicit limitation in the claim at issue was relied upon in holding that the claim was directed to statutory subject matter. *See, State Street Bank*, 149 F.3d at 1373, 47 U.S.P.Q.2d at 1601 (holding that

the transformation of data by the claimed data processing system produced a useful, concrete and tangible result, namely a final share price momentarily fixed for recording and reporting purposes). The claimed invention recited no limitation directed to either a final share price or means for momentarily fixing the final share price for recording and reporting purposes. *See, State Street Bank*, 149 F.3d at 1371, 47 U.S.P.Q.2d at 1599. Indeed, the relied upon useful, concrete and tangible result in *State Street Bank*, namely a final share price momentarily fixed, is not explicitly recited in the *State Street Bank* patent, but is effectively a distillation of the Summary of the Invention. *See, R. Todd Boes*, U.S. Patent No. 5,193,056, col. 4, lines 36-61. Thus, it is beyond peradventure that when judging the claimed subject matter as a whole to determine patentability under 35 U.S.C. § 101, the claims must be construed in the light of the specification.

In short, the question whether a claim encompasses statutory subject matter focuses on the essential characteristics of the subject matter, in particular its utility. *State Street Bank*, 149 F.3d at 1375, 47 U.S.P.Q.2d at 1602.

The Examiner contends that the cited claims do not produce a useful, tangible result. However, claims 1-13 clearly do produce a useful, tangible result. For example, referring to claim 1, claim 1 is directed to a method for determining the quality of a result of a clustering data processing operation, which includes the steps of: determining a foreground frequency of a bucket within a first cluster; determining a background frequency of the bucket with respect to all of the clusters; comparing the foreground and background frequencies; and determining a quality index based on the comparison. Determining a foreground and a background frequency; comparing the foreground and background frequencies; and determining a quality index are steps that are directed to a useful, tangible, result, namely determining the quality of a result of a clustering data processing operation.

Similarly, referring to claim 10, claim 10 is directed to a method for data clustering, which includes the steps of: performing a number of data clustering operations; determining a quality index for each result of the data clustering

operations; and <u>selecting the result with the highest quality index</u> as an end result of the data clustering. Performing a number of data clustering operations; determining a quality index for each result; and selecting the result with the highest quality index are steps that are directed to a useful, tangible, result, namely, selecting the end result of a clustering data processing operation.

Similarly, referring to claim 11, claim 11 is directed to a method for <u>data clustering</u>, which includes the steps of: <u>selecting an initial set of clusters</u>; <u>determining a quality index for the clusters</u>; and <u>performing a number of iterations to improve the quality index</u>. Selecting an initial set of clusters; determining a quality index for the clusters; and performing a number of iterations to improve the quality index are steps that are directed to a useful, tangible, result, namely, improving the quality index.

Similarly, referring to claim 13, claim 13 is directed to a computer program product for <u>determining the quality of a result of a clustering data processing operation</u>, which includes the steps of: <u>determining first subprocesses for a foreground frequency</u> of a bucket within a first cluster; <u>determining second subprocesses for a background frequency</u> of the bucket with respect to all of the clusters; <u>comparing third subprocesses the foreground and background frequencies</u>; and <u>determining fourth subprocesses a quality index</u> based on the comparison. Determining a foreground and a background frequency; comparing the foreground and background frequencies; and determining a quality index are steps that are directed to a useful, tangible, result, namely, determining the quality of a result of a clustering data processing operation.

As stated above, the inquiry under 35 U.S.C. §101 is whether there is a practical application, or result. *State Street Bank*, 149 F.3d at 1373, 47 U.S.P.Q.2d at 1601. As discussed above, claims 1-13 are directed to a method and computer program product for data clustering and quality determination. Hence, the subject matter of claims 1-13 has a practical application within the four statutory categories and is not an idea, a law of nature or a natural phenomenon.

The Examiner, in response to Appellants' above argument, assets that claims 1-13 are properly rejected under 35 U.S.C. §101 since the body of the claims do not provide a tangible, useful and concrete result. Office Action (9/22/2006), page 7. Further, the Examiner asserts that sequence of data operations do not cause the claims to produce a tangible, useful and concrete result. *Id.* Appellants respectfully traverse.

The body of the claims, when construed in light of the specification, clearly are directed to producing a useful, tangible, result. As stated above, it is beyond peradventure that when judging the claimed subject matter as a whole to determine patentability under 35 U.S.C. § 101, the claims must be construed in the light of the specification. When claims 1-13 are construed in light of the specification, claims 1-13 are clearly directed to a useful, tangible, result, namely, determining the quality of a result of a clustering data processing operation; improving the quality index, etc. as discussed above.

Further, Appellants did not assert that the sequence of data operations cause claims 1-13 to produce a tangible, useful and concrete result. The Examiner is misunderstanding and transmogrifying Appellants' arguments. Appellants merely point out that the claim limitations of claims 1-13, when construed in light of the specification, are directed to a useful, tangible, result.

Further, as understood by Appellants, the Examiner in his rejection of claims 1-13 under 35 U.S.C. §101 appears to assert that claims 1-13 essentially recite mathematical algorithms and therefore are directed to non-statutory subject matter (Examiner appears to assert that the limitations are nothing more than computer algorithms or data operations). Office Action (9/22/2006), pages 4, 6-7. However, the Federal Circuit has clearly indicated that whether or not a claim has recited to mathematical algorithms is not determinative of whether the claim has statutory subject matter. *State Street Bank & Trust Co. v. Signature Financial Group, Inc.*, 47 U.S.P.Q. 1596, 1601-1602 (Fed. Cir. 1998). In fact, the Federal Circuit specifically

stated that "[u]nder *Benson*, this[1] may have been a sufficient indicium of nonstatutory subject matter. However, after *Diehr* and *Alappat*, the mere fact that a claimed invention involves inputting numbers, calculating numbers, outputting numbers, and storing numbers, in and of itself, would not render it nonstatutory subject matter, unless, of course, its operation does not produce a 'useful, concrete and tangible result.'" *Id.* at 1602.

Hence, the question of whether a claim encompasses statutory subject matter should not focus on which of the four categories of subject matter a claim is directed to—process, machine, manufacture, or composition of matter—<u>but rather on the essential characteristics of the subject matter, in particular, its practical utility</u>. *Id.* Here, as stated above, claims 1-13 are directed to a useful, concrete and tangible result, namely, determining the quality of a result of a clustering data processing operation; improving the quality index, etc. as discussed above.

Thus, Appellants respectfully contend that claims 1-13 constitute statutory subject matter. Appellants respectfully assert that the rejections of claims 1-13 under 35 U.S.C. §101 are in error.

B.   <u>Claims 1-13 are not properly rejected under 35 U.S.C. §112, second paragraph.</u>

The Examiner has rejected claims 1-13 under 35 U.S.C. §112, second paragraph, for allegedly being indefinite for failing to particularly point out and distinctly claim the subject matter which Appellants regard as the invention. Office Action (9/22/2006), page 5. In particular, the Examiner asserts that the step of "determining a quality index based on the comparison," as recited in claim 1, and similarly in claims 10, 11 and 13, is unclear. *Id.* The Examiner continues by stating:

> It's unclear to the Examiner on how the comparison between the foreground and background frequency would change or affect [sic] the quality of the index, since the claims don't disclose any thing related or claims the index or the index quality. The examiner believes there is a

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[1] Referring to the Freeman-Walter-Abele test which determines whether a claim has statutory subject matter based on the presence of an algorithm.

missing step between step c, and step d. Clarification is required.
Office Action (9/22/2006), page 5.

Appellants respectfully traverse the assertion that Appellants failed to particularly point out and distinctly claim the subject matter which Appellants regard as the invention.

A rejection based on Appellants failure to claim the subject matter which Appellants regard as the invention is appropriate only where Appellants have stated, somewhere other than in the application as filed, that the invention is something different from what is defined by the claims. *In re Moore*, 439 F.2d 1232, 169 U.S.P.Q. 236 (C.C.P.A. 1971); M.P.E.P. §2172. The Examiner has not provided any evidence that the invention is something different from what is defined by claims 1, 10, 11 and 13. In fact, the invention is not different from what is defined by claims 1, 10, 11 and 13. Accordingly, Appellants respectfully assert that claims 1-13 are allowable under 35 U.S.C. §112, second paragraph.

Further, a rejection under 35 U.S.C. §112, second paragraph, is not appropriate, when the scope of the claimed subject matter can be determined by one having ordinary skill in the art. M.P.E.P. §2173. Appellants respectfully assert that one having ordinary skill in the art can determine the scope of the limitation of "determining a quality index based on the comparison," as recited in claim 1, and similarly in claims 10, 11 and 13. Appellants respectfully direct the Board to page 8, line 1 – page 10, line 9 of the Specification which discusses, in one embodiment, how a quality index is determined based on the comparison between the relative foreground and background frequencies. Claims 1, 10, 11 and 13 clearly set forth the metes and bounds of the patent protection desired in relation to determining a quality index based on the comparison as discussed on page 8, line 1 – page 10, line 9 of the Specification. The Examiner has not provided any evidence that a person of ordinary skill in the art would not be able to determine the scope of the claimed subject matter in claims 1, 10, 11 and 13. One having ordinary skill in the art can determine the scope of the claimed subject matter in claims 1-13. Consequently, Appellants

respectfully assert that claims 1-13 are allowable under 35 U.S.C. §112, second paragraph.

Further, the Examiner's focus during examination of claims for compliance with the requirement for definiteness of 35 U.S.C. §112, second paragraph, should be whether the claim meets the threshold requirement of clarity and precision, not whether more suitable language or modes of expression are available. M.P.E.P. §2173.02. Definiteness of claim language must be analyzed, not in a vacuum, but in light of the content of the particular application disclosure; the teachings of the prior art; and the claim interpretation that would be given by one possessing the ordinary level of skill in the pertinent art at the time the invention was made. M.P.E.P. §2173.02. In reviewing a claim for compliance with 35 U.S.C. §112, second paragraph, the Examiner must consider the claim as a whole to determine whether the claim apprises one of ordinary skill in the art of its scope and, therefore, serves the notice function required by 35 U.S.C. §112, second paragraph, by providing clear warning to others as to what constitutes infringement of the patent. *See, e.g., Solomon v. Kimberly-Clark Corp.*, 216 F.3d 1372, 1379, 55 U.S.P.Q.2d 1279, 1283 (Fed. Cir. 2000); M.P.E.P. §2173.02. As shown above, the scope of claims 1, 10, 11 and 13, and in particular the limitation "determining a quality index based on the comparison," when analyzed in light of the Specification, can be determined by one of ordinary skill in the art and therefore serves the notice function required by 35 U.S.C. §112, second paragraph. Consequently, Appellants respectfully assert that claims 1-13 are allowable under 35 U.S.C. §112, second paragraph.

Further, the Examiner's basis for his rejection of claims 1, 10, 11 and 13 under 35 U.S.C. §112, second paragraph, is that it is unclear to the Examiner how the comparison between the foreground and background frequencies would change or affect the quality of the index. Office Action (9/22/2006), page 5. Appellants respectfully contend that this ground of rejection does not provide a basis for a rejection under 35 U.S.C. § 112, second paragraph. The purpose of a claim is not to explain technology or how it works. *S3 Inc. v. nVIDIA Corp.*, 59 U.S.P.Q.2d 1745, 1748 (Fed. Cir. 2001). The purpose is to state the legal boundaries of the patent grant.

Id. Appellants respectfully assert that the claimed subject matter in claims 1-13 can be determined by one having ordinary skill in the art. The rejection under 35 U.S.C. § 112, second paragraph, is not appropriate if the scope of the claimed subject matter can be determined by one having ordinary skill in the art. M.P.E.P. §2173. Consequently, Appellants respectfully assert that claims 1-13 are allowable under 35 U.S.C. § 112, second paragraph.

Further, in response to the Examiner's statement that the Examiner believes there to be a missing step between steps (c) and (d), Appellants respectfully traverse. Appellants respectfully assert that claims 1, 10, 11 and 13 do not omit matter disclosed to be essential to the invention as described in the Specification. Accordingly, claims 1-13 are allowable under 35 U.S.C. §112, second paragraph.

Furthermore, the Examiner has not specifically pointed out the essential step deemed to have been omitted from claims 1, 10, 11 and 13. The Examiner must specify the matter disclosed to be essential to the invention in the Specification that was not claimed in claims 1, 10, 11 and 13. *See In re Mayhew*, 527 F.2d 1229, 188 U.S.P.Q. 356 (C.C.P.A. 1976); M.P.E.P. §2172.01. Again, Appellants respectfully assert that claims 1, 10, 11 and 13 do not omit matter disclosed to be essential to the invention as described in the Specification. Accordingly, claims 1-13 are allowable under 35 U.S.C. §112, second paragraph.

Furthermore, a rejection for omitting essential steps is not appropriate under 35 U.S.C. §112, second paragraph. M.P.E.P. §2172.01. Instead, such a rejection is appropriate under 35 U.S.C. §112, first paragraph. M.P.E.P. §2172.01. Accordingly, claims 1-13 are allowable under 35 U.S.C. §112, second paragraph.

Further, the Examiner states:

> It's unclear on how the system would compare foreground to the background and if [sic] the comparison is to be performed between the first [sic] cluster and all the [sic] clusters [sic]? The [sic] claims call [sic] for comparison for a foreground and background but does not disclose the comparison with what. Therefore, the 112 rejection is maintained and finalized. Office Action (9/22/2006), page 6.

As stated above, the purpose of a claim is not to explain technology or how it works. *S3 Inc. v. nVIDIA Corp.*, 59 U.S.P.Q.2d 1745, 1748 (Fed. Cir. 2001). The purpose is to state the legal boundaries of the patent grant. *Id.* Appellants are not required to provide claim limitations to explain how the comparison between foreground and background frequencies is made. Instead, 35 U.S.C. §112, second paragraph, requires that the scope of the claimed subject matter to be determined by one having ordinary skill in the art. M.P.E.P. §2173. As pointed out above, the claimed subject matter in claims 1-13 can be determined by one having ordinary skill in the art. Consequently, Appellants respectfully assert that claims 1-13 are allowable under 35 U.S.C. § 112, second paragraph.

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VIII. CONCLUSION

For the reasons noted above, the rejections of claims 1-13 are in error. Appellants respectfully request reversal of the rejections and allowance of claims 1-13.

Respectfully submitted,

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CLAIMS APPENDIX

1.   A method for determining the quality of a result of a clustering data processing operation, the result comprising a set of clusters, a cluster having a set of buckets for each variable, the method comprising the steps of:

a)   determining a foreground frequency of a bucket within a first cluster;

b)   determining a background frequency of the bucket with respect to all of the clusters;

c)   comparing the foreground and background frequencies; and

d)   determining a quality index based on the comparison.

2.   The method of claim 1, wherein said comparing step further comprises subtracting the relative foreground and background frequencies.

3.   The method of claim 2, wherein said comprising step further comprises squaring the result of the comparison.

4.   The method of claim 1, further comprising the steps of:

e)   determining an optimal number of clusters; and

f)   comparing the optimal number of clusters to the actual number of clusters resulting from the clustering data processing operation.

5.   The method of claim 4, wherein the optimal number of clusters is determined by a maximum number of buckets for a variable.

6.   The method of claim 5, wherein the optimal number of clusters is set to a threshold value in case the maximum number of buckets is greater than the threshold value.

7.   The method of claim 4, further comprising the steps of:

g)   determining a factor based on the optimal number of clusters and the actual number of clusters; and

h)   multiplying the result of the comparison of the relative foreground and background frequencies with the factor.

8.   The method of claim 7, further comprising the steps of:

i)   determining a normalizing value being independent of any correlations between fields of the data on which the data processing operation is applied; and

j)   normalizing the result of the comparison of the foreground and background frequencies by means of the normalizing value.

9.   The method of claim 8, wherein said step of determining the normalizing value further comprises:

i)   comparing the background frequencies of the buckets with an imaginary cluster having a foreground frequency of the bucket equal to one;

ii)   comparing the background frequencies of the buckets with an imaginary cluster having a foreground frequency of the bucket equal to zero; and

iii)   summing the results of the corresponding comparison values.

10.   A method for data clustering, said method comprising the steps of:

a)   performing a number of data clustering operations;

b)   determining a quality index for each result of the data clustering operations; and

c)   selecting the result with the highest quality index as an end result of the data clustering.

11.   A method for data clustering, said method comprising the steps of:

a)   selecting an initial set of clusters;

b)   determining a quality index for the clusters; and

c)   performing a number of iterations to improve the quality index.

12.   The method of claim 11, further comprising the steps of:

d)   moving at least one record of at least one of the clusters to another

cluster;

  e) determining the quality index for the modified clusters; and

  f) using the modified clusters as a new initial set of clusters in case the quality index improved.

13. A computer program product stored on a computer usable medium for determining the quality of a result of a clustering data processing operation, the result comprising a set of clusters, a cluster having a set of buckets for each variable, the method comprising the said program product comprising:

  determining first subprocesses for a foreground frequency of a bucket within a first cluster;

  determining second subprocesses for a background frequency of the bucket with respect to all of the clusters;

  comparing third subprocesses the foreground and background frequencies; and

  determining fourth subprocesses a quality index based on the comparison.

EVIDENCE APPENDIX

No evidence was submitted pursuant to §§1.130, 1.131, or 1.132 of 37 C.F.R. or of any other evidence entered by the Examiner and relied upon by Appellants in the Appeal.

RELATED PROCEEDINGS APPENDIX

There are no related proceedings to the current proceeding.

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